


35972/2024/HEP-SWM20900

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PRODUCT STANDARD

SWITCHGEAR ENGINEERING DIVISION

SG 12714 REV.03

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SPHERICAL ROD END

1. INTRODUCTION

Spherical rod ends to Drg. No. : 45211001726. 35211001568 & 45211001626 are used at the moving contact end of VI i.e. locations of articulated joints in transmission linkage system of spring operating mechanism of vacuum circuit breaker products.

2. CONSTRUCTION

Spherical rod end is a mechanical articulating joint and consists of a forged head with male or female threading. A plain spherical bearing is press fitted into the head. The plain spherical bearings used are of self-lubricating and maintenance free type.

Spherical rod end can accommodate angular misalignment to allow smooth motion transfer in various applications.

3. MATERIALS

- The forged body of the spherical rod ends shall be made out of following materials :

Rod ends with male threads : 34 Cr Ni Mo 6V

Rod ends with female threads : C45

The rod ends shall be galvanized to protect them against corrosion.

- The plain spherical bearings to be pressed into the head of forged body of the rod ends shall be made out of high strength bearing steels duly heat treated and polished. The design of plain spherical bearing is self-lubricating and maintenance free. The materials of parts in sliding contact may have following designs:

Steel on PTFE :

The sliding area of outer ring is overlaid with PTFE liner reinforced with glass fibre. The hard chromed inner surface slides over this liner.

Steel on composite material :

A layer of porous tin bronze whose pores are impregnated with a mixture of PTFE and lead is sintered on to the steel and this composite material is applied on to the outer ring forming the sliding surface over which hard chromed inner ring surface slides.

4. OPERATING TEMPERATURE RATING

The operating temperature range required for the spherical rod ends is –20°C to 120°C.

REV.

03

PRINTS TO :-

APPROVED –

ALTD.

RG/VKD

Issue Online

R.K.SHUKLA

APPD.

MAK

PREP

ISSUED

DATE

DATE.

29/03/2014


SMM

RAJESH

17/07/1995

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		5. LOAD RATINGS The basic static load (Co) and dynamic load (Cr) ratings are as mentioned on the item drawing. At loads up to the magnitude of the static load rating no permanent deformation should develop in sliding surface parts and the forged body of the rod ends. Moreover, no increase in friction or seizing of the surfaces in sliding contact should occur.	
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals. Limited It must not be used directly or indirectly in any way detrimental to interest of Co.		6. DIMENSIONS The dimension of the rod ends shall be as per item drawing. Also, the ID of plain spherical bearing shall be as per the drawing.	
		7. TEST REQUIREMENTS Following checks / tests shall be conducted at the supplier's works : <ul style="list-style-type: none"> - Dimensional checks as per drawing. - Test to verify materials used and process followed. - Testing the static load rating (Co) (Refer para 5). 8. ACCEPTANCE CRITERION SUPPLIERS CERTIFICATE : <ul style="list-style-type: none"> - Supplier shall send test certificate of meeting the requirements outlined in Para 7 with every lot of supply for acceptance. - Supplier shall send test certificate confirming the material of the Plain Spherical bearing. - Identification mark as per Cl.9.0 TESTS AT BHEL : For supplies from reputed bearing manufacturers / established sources such as M/s SKF, M/s Schaeffler Technologies (FAG), M/s Hirschmann GMBH, no tests at BHEL are required. In such cases, the Supplier's Test Certificate / Guarantee certificate for originality is sufficient for the acceptance of the item. However for new supplies, the first lot of 50 nos. to be supplied to carry out dimensional checks, verification of static load rating and dynamic load carrying capacity. For carrying out the static load test the rod end shall be mounted as shown below and the load applied in axial direction. For dynamic load carrying capacity, at least 5 nos. rod end shall be subject to 600 nos. no-load make/break operation with PVN36 with D2/ VM12 assembled with C1 interrupter. After 600 nos. operation there shall be no change in play between the forged body and the spherical bearing. Observations during static load testing shall be as per Cl. 5.0.	

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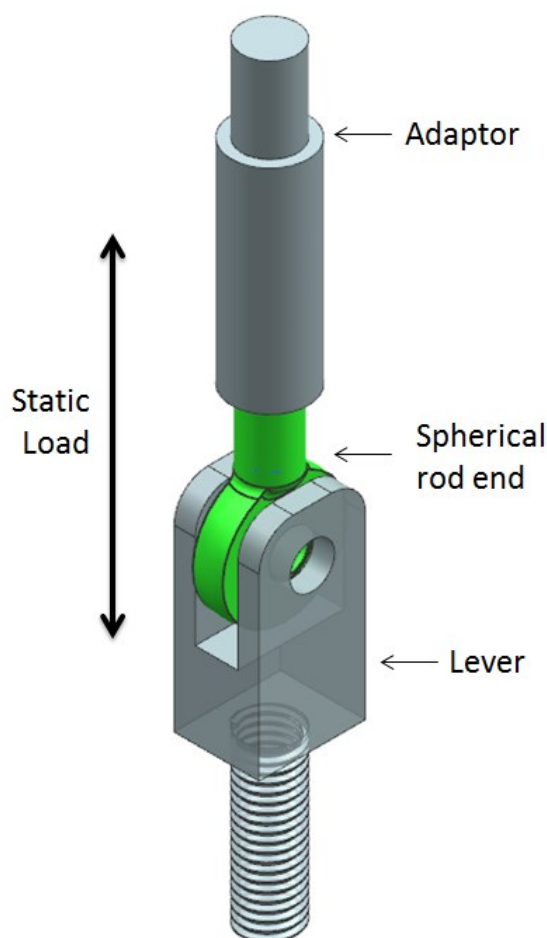
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9. IDENTIFICATION MARKINGS

Supplier's name / logo and item designation shall be engraved / punched on the side face of the (i) rod end forging and (ii) plain spherical bearing

10. PACKAGING

The rod ends shall be wrapped in polythene in a set of 20 numbers. These polythene wrappings shall be placed in a corrugated paper box with both sides as flat liner.